



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,967	09/30/2003	Frederick M. Discenzo	02AB125C/ALBRP294USC	4945

7590 03/14/2005

Susan M. Donahue
Rockwell Automation, 704-P, IP Department
1201 South 2nd Street
Milwaukee, WI 53204

EXAMINER

MARTIR, LILYBETT

ART UNIT	PAPER NUMBER
----------	--------------

2855

DATE MAILED: 03/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/674,967

Applicant(s)

DISCENZO, FREDERICK M.

Examiner

Lilybett Martir

Art Unit

2855

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-21 and 23-28 is/are rejected.
- 7) ☒ Claim(s) 9, 10 and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-8, 11-18, and 23-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Discenzo (Pat. 5,723,794).

- With respect to claims 1, 23 and 28, Discenzo teaches a layer of photo-elastic material 76 that overlays a portion of a structure 16; a signal emitting component 40 that delivers a signal to the photo-elastic material, the signal is directed through the photo-elastic material along an axis of rotating structure (note that the signal is directed through the photo-elastic material 36 along the axis perpendicular to the sleeve 30 shown in Figures 1 and 3); and an analysis component 52 that receives light exiting the photo-elastic material, the exiting signal associated with structural degradation characteristics (Col. 2, lines 10-17).
- With respect to claim 2, Discenzo teaches the structure is at least one of a shaft 16, a coupler, and a composite joint.
- With respect to claims 3 and 25, Discenzo teaches structural degradation characteristics are at least one of fatigue, cracking, breakage, rate of

degradation, amount of degradation, and misalignment (change in position, Col. 2, lines 10-17)).

- With respect to claim 4, Discenzo teaches the signal is at least one of: an optical signal (Col. 1-2, lines 66-3), an electromagnetic signal, a RF signal, and an IR signal.
- With respect to claims 5-8, 11-14 and 26-27 Discenzo teaches the utilization of a neural network system trainable to act as an alignment component, that determines axial and lateral misalignment, a joint integrity verifier, which detects defective composite joints, an early breakage detector, which monitors at least one of fatigue, cracking and early signs of breakage, a correction component, which modifies parameters of the structure, based at least in part on information received from the alignment component, a correction component, that modifies parameters of the structure, based at least in part on information received from the joint integrity verifier, a correction component, which modifies parameters of the structure, based at least in part on information received from the early breakage detector, an AI component comprising at least one of: a neural network 54, an expert system, a support vector machine (SVM), a Bayesian belief network, a data fusion system, querying whether correction is needed based on analysis performed on the received signal, and correcting the characteristic of the structure as determined by the query (Col. 2, lines 10-17 and Col. 6-7, lines 57-5).

- With respect to claim 15, Discenzo teaches the photo-elastic material comprising a notch 110 that can be coated with a reflective substance (Col. 10, lines 18-24) and cut at an angle to direct light along a longitudinal axis of the substrate (Col. 9, lines 60-65).
- With respect to claim 16, Discenzo teaches at least one collar of the photo-elastic material is coated with a reflective substance (Col. 10, lines 18-34).
- With respect to claim 17, Discenzo teaches the light passing along a longitudinal axis of the structure twice, initially transmitted 44 and then reflected 50 as noted in Figure 1 (Col. 3, lines 30-35).
- With respect to claim 18, Discenzo teaches the photoelastic material comprising at least one of: a polycarbonate-based compound (Col. 5, lines 47-34), a polyester-based compound, a polysulfone-based compound, a polyether sulfone-based compound, a polystyrene-based compound, a polyolefin-based compound, a polyvinyl alcohol-based compound, a cellulose acetate-based compound, a polyvinyl chloride-based compound, a polymethyl methacrylate-based compound, a polyacrylate-based compound, a polyamide-based compound and/or a combination thereof.
- With respect to claim 24, Discenzo teaches the signal comprises a fringe pattern (See abstract, Col. 1-2, lines 61-3).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Discenzo in view of Lesniak (Pat. 6,055,053).

- With respect to claim 19, Discenzo fails to teach the structure comprising a non-rotating component. Lesniak teaches the utilization of a similar system comprised by similar elements such as 73 and 86 having a stationary specimen 72 with a photoelastic material 74 bonded thereto. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings of the torque sensor of Discenzo utilizing it with a stationary photoelastic stress analysis system as the one taught by Lesniak to make said sensor arrangement versatile.
- With respect to claim 20, Discenzo fails to teach the non-rotating component comprising at least one of: a bridge structure, an aircraft component, an industrial machine, and a crane. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings to modify the teachings of the torque sensor of Discenzo utilizing it to monitor different elements to make said sensor arrangement versatile.

Art Unit: 2855

5. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Discenzo in view of De laPuente et al (Pat. 6,513,390).

- With respect to claim 21, Discenzo fails to teach the signal emitting component and the analysis component remotely connected to the photo-elastic layer utilizing fiber optical cable. De la Puente teaches the utilization of optical fiber¹² connected in order to transmit light to a photoelastic member (Col 5, lines 31-54). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the teachings to modify the teachings of the torque sensor of Discenzio utilizing the teachings of the torque and strain sensor of De la Puente by providing in it the signal emitting component and the analysis component remotely connected to the photo-elastic layer utilizing fiber optical cable to further prevent the introduction of external light into the system therefore increasing it's reliability and accuracy.

Claim Objections

6. Claim 1 is objected to because of the following informalities: in line 2, the applicant recites a "structure", and in line 4 it recites a "rotating structure". It is not clear from the disclosure if both elements are the same one or two different elements Appropriate correction is required to clarify the scope of said recitations.

Allowable Subject Matter

7. Claims 9-10 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, or if the limitations of said claims are introduced in the base claim, including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments filed 12/8/04 have been fully considered but they are not persuasive. The recitation of "along an axis of rotating structure" does not imply that the directed signal moves in a specific path, since it can be assumed that said axis is either a straight line with respect to which a body or figure is symmetrical or one of the reference lines of a coordinate system. Therefore, Discenzo does teach the signal being directed through the photo-elastic material along an axis in the rotating structure. The claim never mentions that said axis is the rotational axis of said structure or any other specific axis.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

10. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action.

Art Unit: 2855


In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lilybett Martir whose telephone number is (571)272-2182.

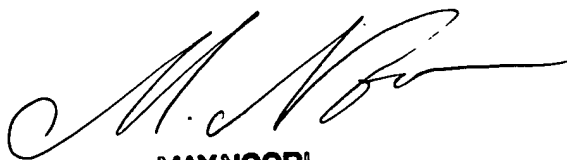
The examiner can normally be reached on 9:00 AM to 5:30 PM.

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571)272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Lilybett Martir
Examiner
Art Unit 2855

LM


MAX NOORI
PRIMARY EXAMINER